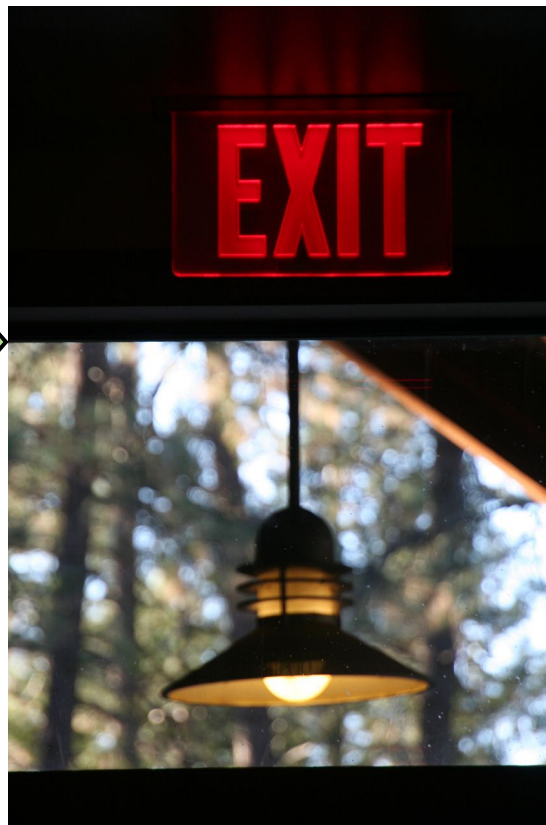


Sustainability as an Art at Idyllwild Arts

Whats wrong with this picture?



Evan Mills | evanmills1@gmail.com | November 1, 2011

Observations

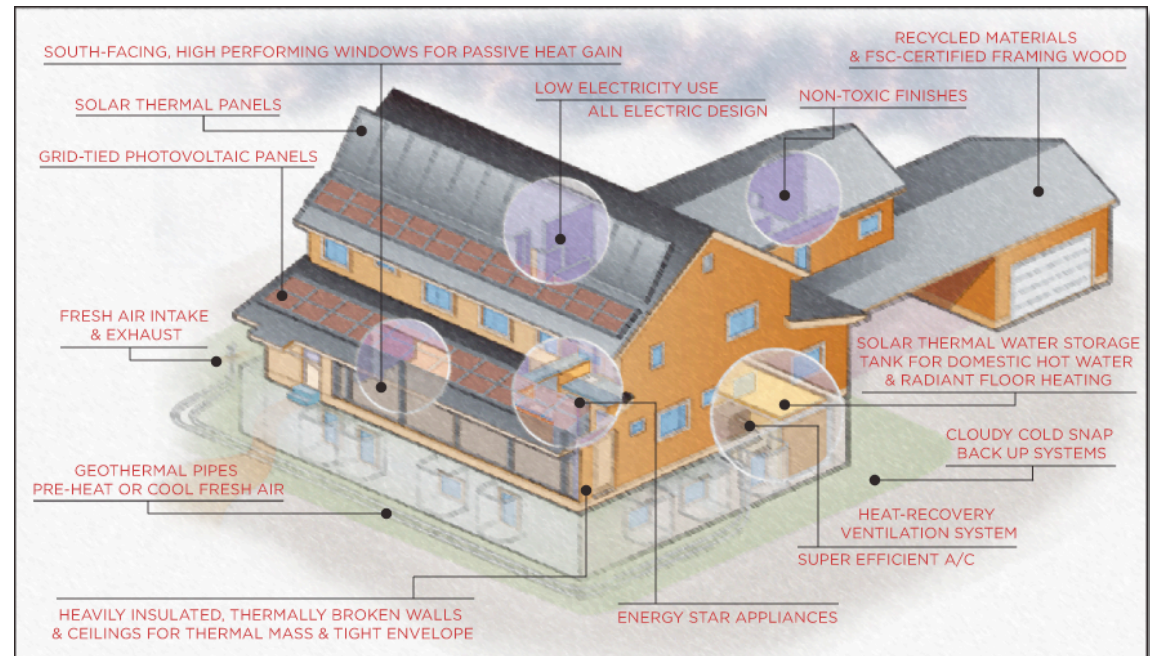
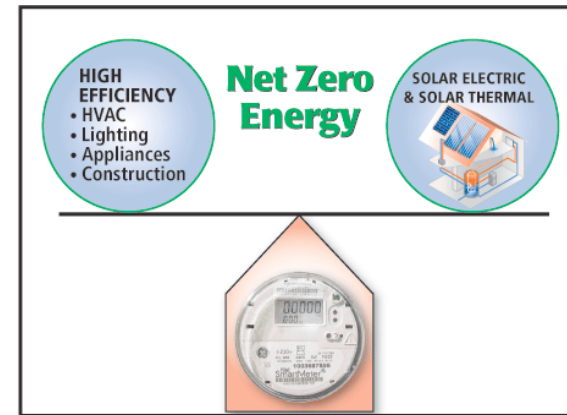
- For the first time in the school's 60-year life, the will is here to 'do it right'!
- That the message is coming from "The Top" is invaluable.
- Students want this! Faculty seem to as well....
- Excellent start with committee structure and general reconnaissance that has already happened
- More energy (& water) is likely wasted as a result of how systems are used and maintained than because equipment is not "green" (and use controlled by students probably isn't the #1 problem; rather it's kilns, pools, outdoor light...)
- Lack of in-house knowledge and capacity will undermine the benefits of any green widgeits that might get installed

Some key recommendations

- Walk before you run. Avoid temptation to jump randomly at apparent opportunities before big picture is in focus, and without community buy-in
 - ➡ However, lost opportunities should be averted (poor new buildings, replacing broken equipment with low-efficiency).
 - ➡ Institute “green” purchasing guidelines (paper, windows, water heaters....)
 - ➡ Base decisions on facts and data rather heresay and custom
- We are still flying rather blind (don’t know much at all about where energy and water are going, or even have a comprehensive grip on the baseline)
- O&M “culture” is abysmal. This needs attention before capital investments.
 - ➡ Staff needs to be consulted (they hold key, actionable knowledge that “office” doesn’t), but also needs training and continuing education.
 - ➡ Create aggressive “sleep mode” plan to turn things off when school is out.
 - ➡ Fix operational problems before buying new “stuff”
- Heretical Thought: LEED certification is costly (fees, paperwork). Perhaps better to plough that \$ back into bricks-and-mortar improvements instead....
- Initiate annual Sustainability Reporting process to foster culture of attention, articulate baselines and targets, track progress, communicate to stakeholders

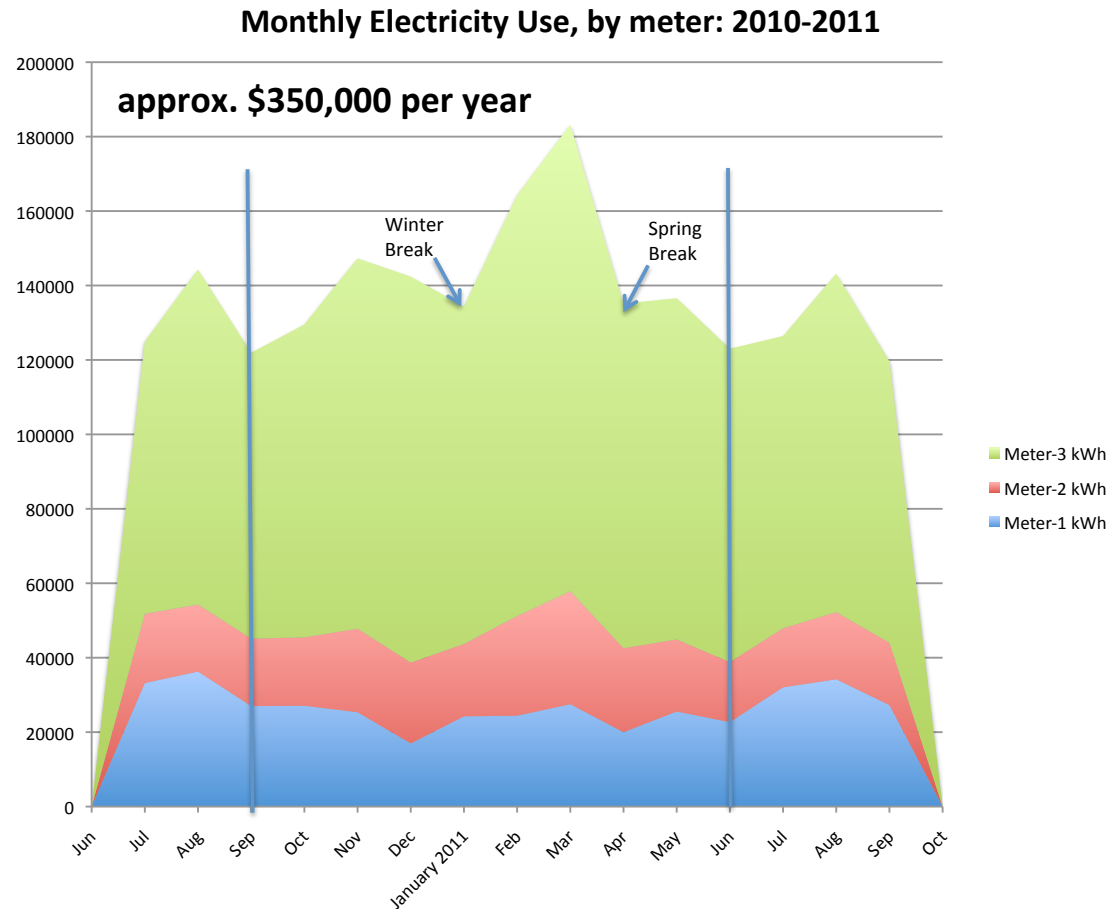
Walk the talk @ Directors home: Zero net energy use

- Max-out energy-efficiency (including all lighting and appliances).
- All-electric if possible
- Meet remaining demand with photovoltaics (incl. car)
- MANY homes are being built to this standard around the country



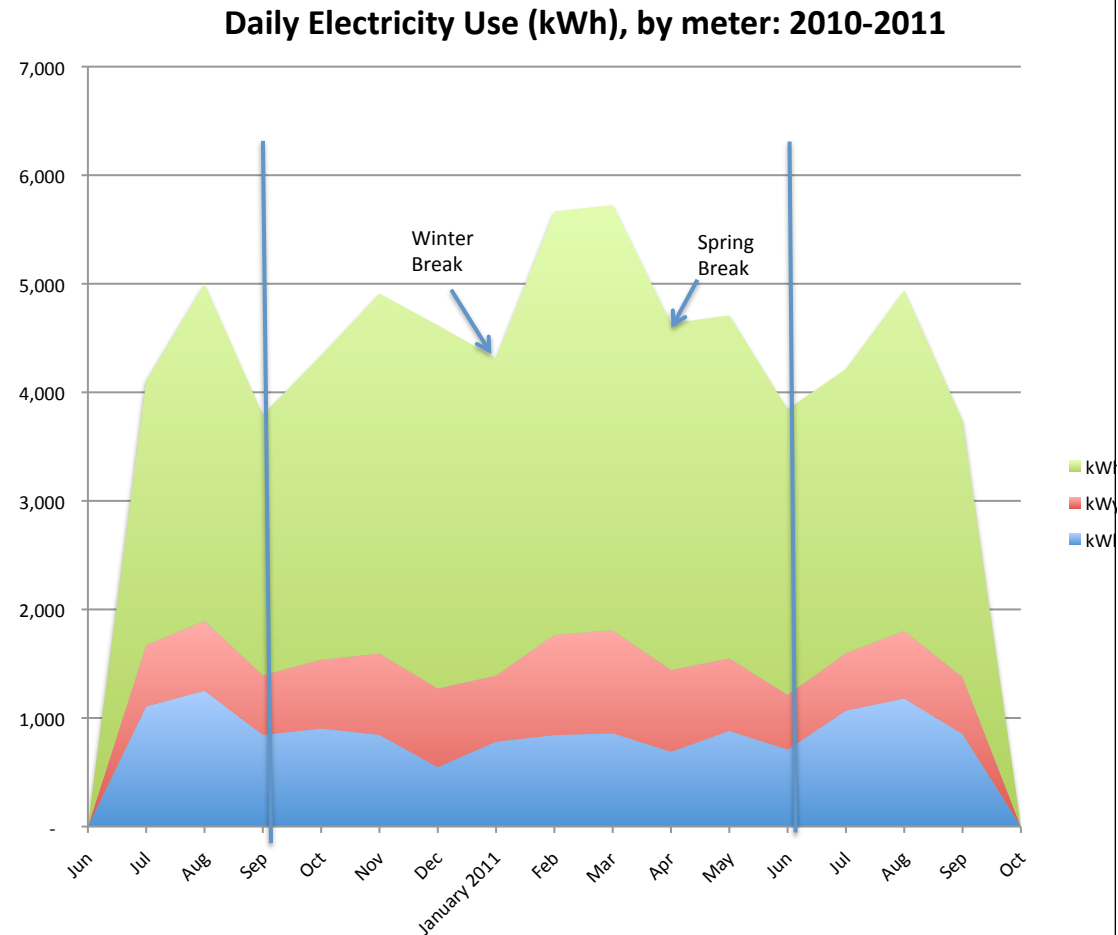
Electricity

- Electricity data only available for latest year.
- Critical to assemble multi-year data to better understand allocation and trends.
- Meters need to be mapped to individual facilities to better understand where and how the energy is actually used.
- Submetering needed.



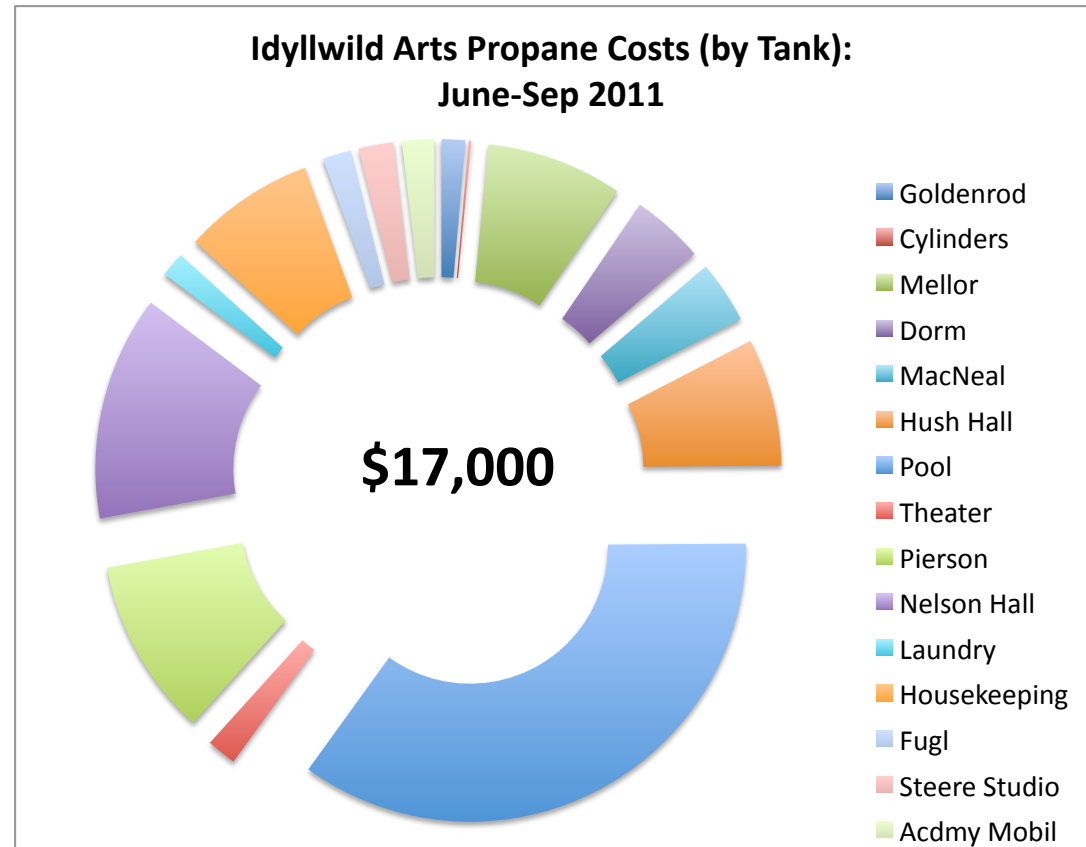
Electricity

- Chart adjusted for variations in “monthly” billing periods
- Why does use go down so little during breaks? Need to institute “sleep mode” for these times, as they equal almost two months per year (15% of the time).



Propane

- Propane data only available for summer 2011.
- Critical to assemble multi-year data to better understand allocation and trends
- Tanks need to be mapped to individual facilities to better understand where and how the energy is actually used.



Paradoxes

- Premium-efficiency exit sign superimposed over an outdoor light on during broad daylight is indicative of the inconsistency of efforts currently underway at the Campus
- Two occupants of the building could not find the switch for the outer light.



All Wet

- Wise past decision to keep pool unheated in winter, but absence of pool cover results in substantial evaporation of valuable water, and circulation pumps (likely on more than necessary) continue to waste electricity in the unused pool.
- If not already in use, pool cover should be employed during water-heating season.



Overcooled & under-appreciated

- Archivist shares room with records. Records need much lower temperatures and lighting levels than do humans.
- One light switch controls 24 bulbs in 12 fixtures. Archivist probably only needs 1-2 fixtures when at desk.
- Single heating/cooling “zone” (one thermostat) thwarts any effort at proper environmental control.
- Students (uncomfortable in outer museum/classroom, unwittingly jeopardize archives by turning up thermostat).



Occupants out of the loop

- Seven thermostats isolated from most occupants of Library complex.



Mixed practices in library

- Dual-switching (every other fixture is on a given switch) in Library: an excellent practice. Further savings may be garnered by use of photocells to control lights next to the window zone.
- High-wattage discharge (metal halide?) lamps on in bay window during daytime.
- Ballasts buzzing loudly throughout room; probably candidates for (quiet) efficiency upgrade
- Occupancy sensors could probably be added in stacks area to reduce on-time.
- Consider de-lamping (or down-lamping) the upward-facing bulbs in the stacks (each fixture has two bulbs, one pointing up and one down)



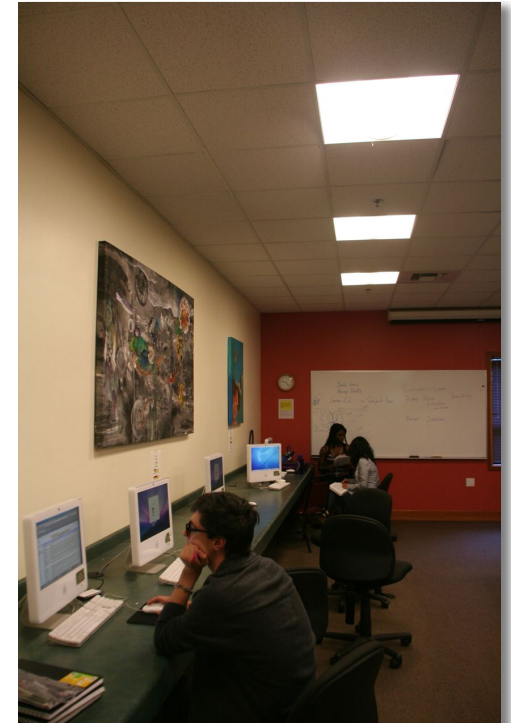
Sins of our Fathers

- “Forgotten” enormous commercial fridge in kitchen area next to Krone Library is indicative of the absence of a culture of attention to resource use.
- Fridge is almost empty. Determine whether it is needed at all (or keep unplugged for the few days a year it is needed for a big catered event).



Bugged by Lighting

- Computer room has modern dimmable fluorescent ballasts. Do occupants know they're present and how to use?
- Insect and dirt accumulation in luminaire diffusers causes lights to be un-necessarily dimmed "up". Also evidences lack of awareness, care, and maintenance.



No “Rush” to kill lights

- At least 24 fixtures (48 lamps) on in mid-day with room empty.
- Black paint and dropped frame below fixtures absorb substantial proportion of light.
- Hooray for new LED stage lights, but waste from overhead fluorescents will likely erase any savings.



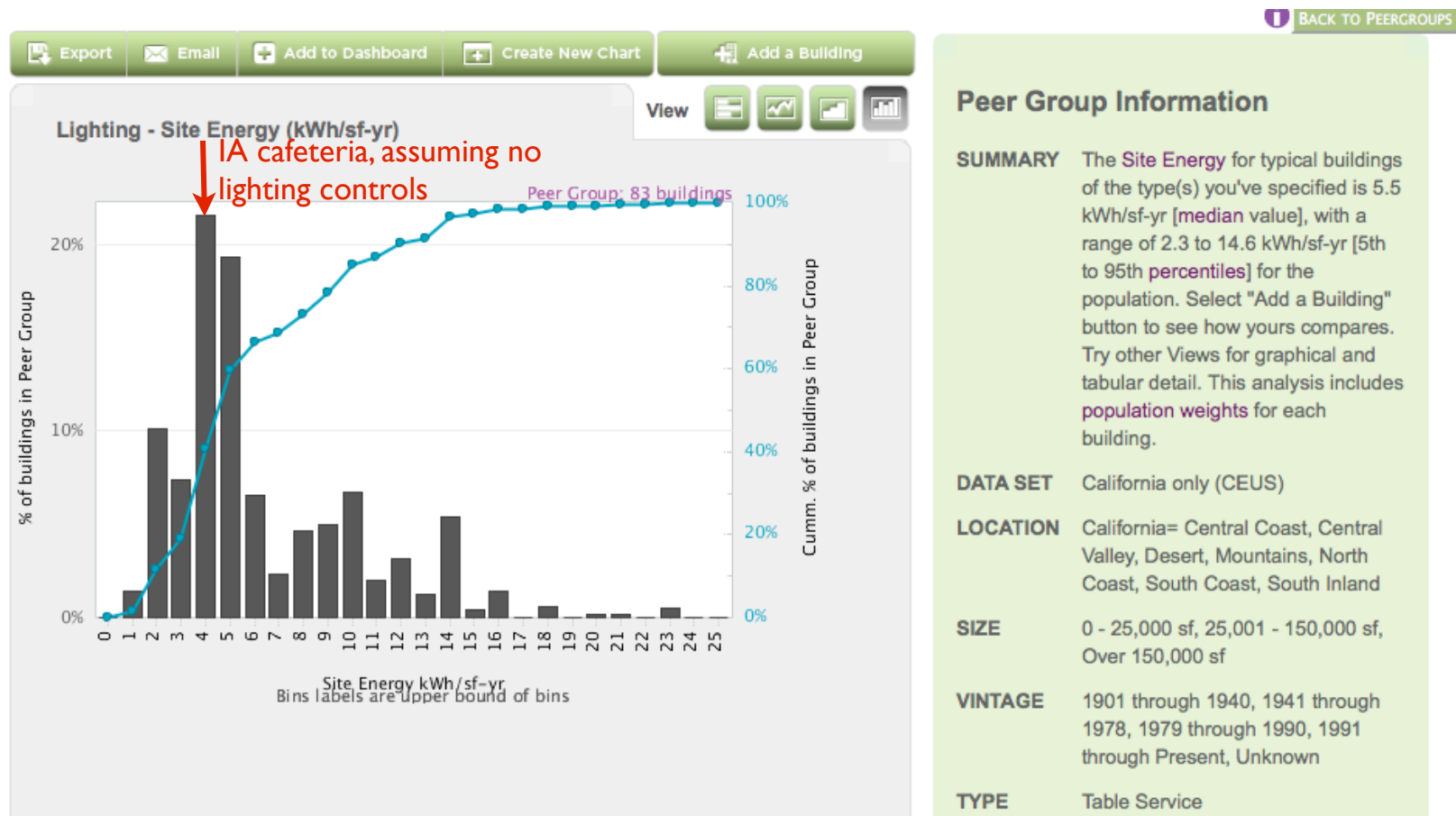
Neglect-a-watts

- Scores of “energy-efficient” lights on during the day across campus.
- More evidence of deferred maintenance, lack of concern about resource use.
- Also burns out lights at least 2x faster than otherwise, thereby doubling labor costs for lamp replacement.
- Many broken photocells



Benchmarking: IA Cafeteria Lighting

*Better than average vs 83 other California restaurants.
But significant room for improvement (50%+)*



A-bowman-ations

- Massive heater is nominally 80% efficiency.
- Appears in ill-repair (service doors hanging open, etc.)
- Ducts must lose vast amounts of energy.....
- (what's that insulation doing on the ground?)



Dorm wars

- According to maintenance crew, students prop common-area doors open in dorms (so they don't have to walk around back to reach normally unlocked door?)
- Since only one thermal 'zone', the bedrooms overheat and windows are opened.



Ceramics area uses prodigious amounts of energy



A sustainability basket-case

- Steere Studio is a historical “crowned jewel” but a contemporary sustainability basket-case.
- No insulation; loose single-paned windows; leaks like a sieve, massive unused waste-heat resource (from kilns)



Steere clear of waste

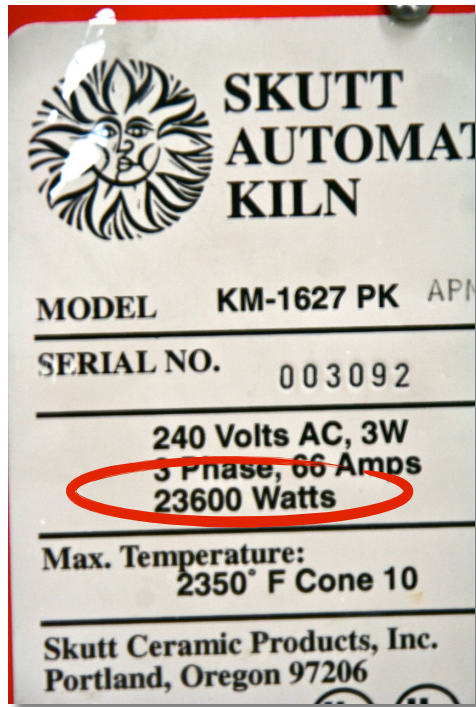
- Ancient furnace in throwing room, despite massive waste heat available a few paces away in kiln room.
- Skylight(s) could obviate need for electric lights in daytime.
- Perhaps waste-heat could even be recovered and used to heat not only Steere Studio, but nearby buildings as well



Electric kilns use 50,000 watts of power



Electric peak demand charges



- Current rate is about \$12 per kilowatt (1 kW = 1000 watts)
- Campus-wide peak ~ 400kW
- ~\$5000/month
- 3 Electric kilns total ~50kW
- If 24kW occurs on peak (worst case), charges would be almost \$300 per firing* for peak demand (not including the electricity consumption). If not, charge is \$0.

** highest single peak for entire month sets the fee.*



All lit up & nowhere to go

Parks Gallery is just an example of what happens
Campus-wide

70 lights, on at three different times visited in one day
(with no one else present)

~5 kilowatts x 8h/day x 200d/y x \$0.16/kWh = **\$1700/year**
+DEMAND charge = 5kW x \$12/kW = \$60/month = **\$700/year**



Energy antiquities

- Burner technology same as used 40 years ago.
- Fiber material on this kiln door is vastly more insulating than brick, but very vulnerable to damage from students
- Experiment (faster firings, glaze reformulation, etc.)
- Fire kilns full.
- Bring in consultant with subject matter knowledge to advise on better managing energy use in kilns



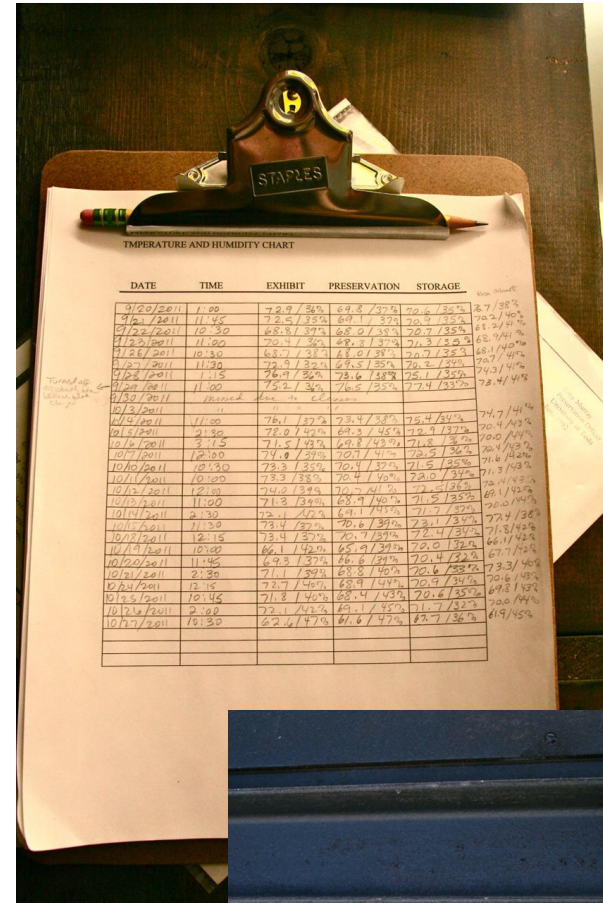
Seal quacks; wrap ducks

- Ducts are found in almost every building, many of which are ancient and significantly leaky, missing insulation, etc.
- Duct losses of 20-50% are common.
- Could institute a comprehensive duct-inspection/sealing program, using in-house trained staff



Inklings of Data Tracking

- Archivist logs daily temperatures
- Potters log kiln temperatures to avoid excessive energy use that occurs when temps “stall” during heat-up period of firing.



Vehicular earth-slaughter

- Need to get a handle on motor pools
- Do vans have to run every 10 minutes to town on weekends?
- Maint crew says their trucks average 6mpg (short trips; idling; etc...)
- Average trip length is probably a mile or two -- perfect for electrics
- Electrics can be solar charged --> zero net energy!



Sustainability as Art

